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VOL. 68 NO. 4 PAGES 49-64

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Refueling in Flight

See Page 63

A SCIENCE SERVICE PUBLICATION

AGRICULTURE

Russians Visit U. S. Farms

Agricultural leaders from the U.S.S.R. find a different kind of genetics in the United States than they know in Russia. Not one of the visitors is a "dirt farmer."

➤ THE TEAM of Soviet agriculturalists now looking over American farms and farm techniques are seeing the practical results of a kind of science politically forbidden to scientists in Russia.

In a two-day stay at Iowa State College of Agriculture and Mechanical Arts, the Russians heard U. S. scientists tell about livestock and plant breeding techniques followed here and in the free world.

They saw breeding farms and laboratories, and are scheduled to visit private farms having the lush fields and fat livestock that are products of Western genetics.

Behind the Iron Curtain, it is political heresy to use or defend genetics as we understand it. Russians have their own brand, tailored to fit the Communist theory.

The official Soviet line in genetics, called neo-Michurianism, goes something like this:

The hereditary constitution of a plant or animal can be "shattered" by "shock treatment." This treatment may be new environmental conditions at critical moments in the life cycle. Thus, changes that occur in a given plant when it is put into a new environment, called "adaptation of the individual" in western genetics, are supposed to become hereditary changes to the Russians.

By this theory, if the Soviet officials desire a new spring wheat, they would try to sprout winter wheat under spring conditions. This environmental "shock" should produce changes in the winter wheat that make it offspring grow naturally as spring wheat.

Heredity just does not work that way on this side of the Iron Curtain.

Genetics in the free world—the genetics that has produced the famous hybrid corns, disease-resistant plants, smaller turkeys and larger cattle—holds that hereditary processes are controlled by chemical groups in the cells called "genes." Only a change in the nature of the genes, a mutation, will lead to a difference in heredity from parent to offspring.

Mutations may occur spontaneously, or they may be induced by such methods as exposure to X-rays or other irradiation. There is no way, however, of predicting how mutations will affect the grown plants or animals. Only observation can show that.

The great practical successes of geneticists in the free world in creating new and better varieties come from their techniques of selective breeding.

They watch for desirable mutations among their test plants or animals. When one is spotted, that individual is separated from the rest, then bred and cross-bred to develop a pure-breeding strain that shows the desired traits according to well worked-out laws of heredity.

The Russians scorn this slow scientific method of trial and error, since by their theory they should be able to coerce nature into their own designs, not adapt nature's varied designs to fit their needs as the west does.

It is, however, the Russians who are having an agricultural crisis, while United States' farm larder is bulging.

The Iron Curtain seems to be lifting a bit recently. Perhaps the agricultural delegation will return with reports of western genetics and its practical results they have seen.

Then, perhaps, genetics may change from a political doctrine into a science in Russia.

Two Are "Zoo Techniks"

➤ TWO MEMBERS of the Russian farm delegation are "zoo technicians."

"Zoo techniks," as they are called in Russia, are animal husbandmen or livestock experts. The schooling required for this title is equivalent to a bachelor's degree in the United States.

Only one member of the 13-man delegation has a doctor's degree. One other has a master's degree. Both degrees are in agricultural science.

It appears that all visiting experts are high officials in Russian agriculture, not one being a "dirt farmer."

The highest ranking official is the chief of the delegation, Vladimir Vladimirovich Matskevich, who is First Deputy Minister of Agriculture and a Deputy of the Supreme Soviet. He is equivalent to an undersecretary of agriculture in the U. S.

The delegates' average age is 48. The youngest, Aleksandr Aleksandrovich Ezheviski, 39, is a deputy minister of Automobile Tractor and Agricultural Machine Building, responsible for the manufacture of this equipment.

Two delegates, the oldest, are 58. They are Yuri Fedorovich Golubash, a deputy minister of State Farms for the Russian Socialist Federated Soviet Republic, a zoo technician, and Dr. Boris Pavlovich Sokolov, chief of the laboratory for selection of corn at the Ukrainian Scientific Research Institute of Grain Agriculture.

All phases of agricultural study appear to have been included in the Russians' choice of visiting delegates, from a farm editor to the chairman of a kolkhoz, or collective farm.

BLINDNESS CARRIER—J. P. McMahon of the Kenya Medical Department is shown here holding a freshwater crab, which he discovered was host to tiny flies carrying river blindness, a disease that once afflicted 36% of Kenya children under six. Treating the river water with DDT eliminated the disease.

EMBRYOLOGY

Pre-Fab Proteins May Cause Embryos' Growth

➤ RAPID GROWTH of embryos may be caused by "prefabricated" proteins.

Evidence uncovered by Dr. A. M. Schechtman and Patricia Knight, zoologists of the University of California at Los Angeles, suggests that whole proteins needed for tissue building may be passed on to the embryo via the mother's blood.

It has generally been thought that proteins cannot get into cells unless they are first broken into amino acids, which then enter cells and are manufactured into big protein molecules.

The U.C.L.A. zoologists injected cow and lobster proteins into chickens. Later what were apparently these identical proteins were detected in the chickens' eggs. Further experiments indicated that the same proteins, when injected into incubated eggs, were absorbed intact by embryos.

It is known that the mother passes antibodies, proteins that protect the embryo against disease, directly to the embryo. It seems likely that other proteins, such as those needed in tissue building, are also passed on without being digested by the embryo.

"Our experiments suggest that this may be a shortcut by which nature provides the embryo, which grows at a phenomenal rate, with the large amount of proteins necessary to maintain this growth," Dr. Schetchtman said.

MEDICINE

Find Polio Virus in Glands

Tonsils and Peyer's patches indicted as primary site of polio infection. Antibodies thus have chance to stop polio virus before it enters the central nervous system.

➤ TONSILS, long under suspicion, have at last been pin-pointed as the primary site of polio infection, along with similar lymph glands in the small intestine.

The discovery, made by Dr. David Bodian of the department of epidemiology, Johns Hopkins University, Baltimore, Md., is believed to be the first record of polio virus found in the body before it appears in the blood stream.

Polio antibodies in the blood, whether natural or from artificial immunization, build up their response to polio while the virus is still multiplying in the tonsils and the Peyer's patches of the small intestine, Dr. Bodian told SCIENCE SERVICE. Thus the antibodies, even at low levels, have a chance to stop the polio virus before it enters the central nervous system through the blood stream.

Speculating on the significance of his findings for a mass immunization program, Dr. Bodian said it seemed conceivable that if a large enough section of the population, both youngsters and adults, were given polio vaccine, the virus might disappear from large communities on a continental scale.

Asked if the current plan to inoculate all first and second graders with polio vaccine would seriously cut the virus' chances of survival, Dr. Bodian said it might have a slight effect.

If all school children were inoculated, however, he said, it might well knock the bottom out of polio.

Children are the principal carriers of polio and if enough children are immunized, it would probably not be necessary to vaccinate the adults in order to stamp out the disease. Some of the principal ways of spreading polio, Dr. Bodian said, are from hand to mouth and mouth to mouth.

Dr. Bodian reported details of his experiment in *Science* (July 15).

In the experiment, three chimpanzees were fed polio virus through the mouth. Before the virus appeared in the blood stream, the animals were killed, and the separate organs were removed and tested for presence of the virus.

Dr. Bodian found relatively high concentrations of the virus in the tonsils and the Peyer's patches, before the virus could be detected in most internal organs. High concentrations of the virus were also found in the lymph nodes that drain the tonsillar and Peyer's patches areas.

From his discovery, Dr. Bodian concluded:

1. There is now a logical explanation for the source of virus found in the secretions of the tonsil-pharynx region of the throat.
2. Invasion of the blood stream by polio virus probably stems from tonsil and Peyer's patches infection by way of the lymphatic pathways and structures that drain these glands.

While his work was done on chimpanzees, Dr. Bodian said it seems likely that this pattern should fit human infection, since isolation of the virus from fatal human cases fits in most particulars with the events seen in the test animals.

Science News Letter, July 23, 1955

BIOPHYSICS

West Coast to Have Medical Nuclear Reactor

➤ A NUCLEAR reactor specifically designed for medical research and treatment will be built at the University of California at Los Angeles, the U. S. Atomic Energy Commission has announced.

The reactor will be the first source of slow and fast neutrons, atomic particles with no electric charge, sufficient for experimental work on animals and treatment of human beings on the West Coast, the AEC reported.

For treatment of deep-seated cancers, both neutrons and gamma rays will be provided by the reactor.

The AEC will contribute $75,000 toward building the atomic pile, and will supply enriched uranium as fuel.

The medical reactor will be a low-power water boiler design, for operation at a power level of about five kilowatts of heat, with a maximum power of 50 kilowatts. It will provide a neutron flow of up to a billion neutrons per square centimeter per second.

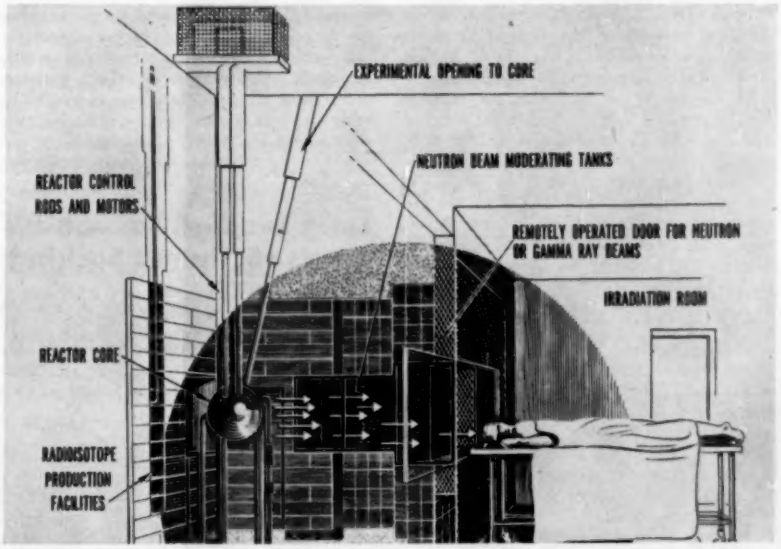
Fissioning of uranium 235 atoms in solution provides the gamma rays and neutrons for medical treatment and other research.

The core will be located inside a 5 x 5 x 8 foot stack of graphite bars, shielded by five feet of high density concrete. Radiation ports will lead from the core to a patient treatment room, laboratory and another room where research on animals can be performed.

An access port will permit materials to be irradiated in a channel leading inside the core itself where radiation will be the strongest.

Although radioisotopes are available from reactors located in various parts of the country, the radioactive strength of these materials is often dissipated by the time they have traveled to the point where they are needed. The U.C.L.A. reactor could provide these materials at near full strength for West Coast requirements.

Science News Letter, July 23, 1955


EXPERIMENTAL OPENING TO CORE
NEUTRON BEAM MODERATING TANKS
REACTOR CONTROL RODS AND MOTORS
REMOTELY OPERATED DOOR FOR NEUTRON OR GAMMA RAY BEAMS
IRRADIATION ROOM
REACTOR CORE
RADIOISOTOPE PRODUCTION FACILITIES

MEDICAL REACTOR—An artist's sketch of the first atomic reactor specifically designed for medical therapy and research is shown here. It will be built for the Medical Center at the University of California at Los Angeles by North American Aviation. The 50-kilowatt reactor will produce neutrons and gamma rays from fuel loaned by the Atomic Energy Commission.

PSYCHOLOGY

Do Not Bully Mentally Ill

➤ NEVER THREATEN a mentally ill person.

Never strike him.

Never call him names.

Never try to bully him.

This advice is contained in the manual for police officers, "How To Recognize and Handle Abnormal People," prepared for the National Association for Mental Health by Drs. Robert A. Matthews and Loyd W. Rowland. (See SNL, July 16, p. 44.)

The police officer or other person who must deal with a violent person should remember, the doctors cautioned, that the patient may already be badly frightened. He may think he is threatened by voices he is "hearing" and he may think that you are just another person who is against him, who wants to punish or kill him. If you are rough, he will be more scared.

He may be reassured if you speak to him in courteous and kindly fashion, take off your hat and invite everybody to be seated.

Do not let jibes of a mental patient get under your skin, the doctors advised.

"Some mental patients are unusually clever in picking out weaknesses and points of irritability in those who are around them. They may show great skill in the way they annoy those who have charge of them. They may call attention to the officer's unattractive baldness, his protruding teeth, his pot-belly or his squeaky voice."

If the person you must deal with has threatened or attempted suicide, be sure that a physician is called. He should be the one to decide whether or not the patient should be sent to a hospital.

"All suicide attempts must be taken seriously," the doctors warned. The life you save by helping the would-be suicide may be an important one.

"It is sometimes true that people who become depressed are extremely fine individuals who contribute much to the social, financial, and intellectual life of the community," they explained.

Sometimes physical illness may make a person appear drunk or insane, they pointed out. Such conditions include diabetic coma, the insulin shock when a diabetic has had too much insulin, the delirium of flu or pneumonia, and various brain conditions.

The police officer's reputation and that of the department may be made or broken by the skill or carelessness with which he handles such a sick person.

Science News Letter, July 23, 1955

MEDICINE

Negroes Resist Malaria

➤ NEGROES ARE highly resistant to the common malaria of the United States in comparison to whites, a team of U. S. Public Health Service scientists has found.

In the course of treatment for syphilis, 104 Negro and 529 white patients were inoculated with *Plasmodium vivax*, the parasite that causes benign tertian malaria.

While infections resulted in 96.2% of the white patients, only 23.1% of the Negroes showed the parasite in their blood, Martin D. Young, Don E. Eyles, Robert W. Burgess and Geoffrey M. Jeffery of the National Microbiological Institute, Columbia, S. C., reported in the *Journal of Parasitology* (June).

During the war years, strains of *Plasmodium vivax* from Tunisia, Sicily, Italy, Korea and the Southwest Pacific were tested, and these foreign strains were unable to infect Negroes with malaria consistently. Thus, the Negro seems to have a general resistance to strains of vivax from all areas, rather than to specific strains, the scientists concluded.

Negroes from non-malarious areas of the United States also show resistance to *P. vivax* infection, they said, indicating that the immunity is natural rather than acquired.

During the test, one Negro received an inoculation containing 1,177,000,000 parasites. This patient showed no parasites in his blood the following day or thereafter.

In contrast, white patients receiving only one-tenth this number of vivax parasites often show them in the blood immediately, and they may be present continuously throughout the primary attack.

Science News Letter, July 23, 1955

PSYCHOLOGY

Long Feeding Session Leads to Thumb Sucking

➤ IF BABY sucks his thumb, it may be because he sucked too long on his bottle.

New research casts doubt on the opposite psychoanalytic theory that lack of bottle or breast sucking causes the infant to suck thumb or fingers.

This theory was put to a test by Dr. Theodore H. Blau and Mrs. Lili R. Blau, psychologists of Tampa, Fla. They fed a baby a few weeks old with the standard two-hole nipple on his bottle and, alternately, with a nipple in which six extra holes were punched.

With the eight-hole nipple, the baby finished his bottle in about 13 minutes less time than he spent sucking on the two-hole nipple.

Nevertheless, he took longer to get to sleep after the longer session on the bottle with only two holes in the nipple. More crying and more general restlessness was associated with the longer feeding. Most important, the long-feeding session was accompanied by more "non-nutritive" sucking, such as thumb and finger sucking.

The current psychoanalytic theory thus was reversed by this research, reported by the two psychologists in the *Journal of Abnormal and Social Psychology* (July).

If thumb sucking is a result of the way the young infant feeds, it would seem to be due to long and hard sucking at the bottle, not to taking the bottle away too soon.

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WILDLIFE

Whooping Cranes Found

Although only four nestlings and an unhatched egg were discovered at the birds' breeding ground, scientists see only a slim chance that the cranes can make a comeback.

➤ NATURALISTS are waiting for the solitary flock of whooping cranes to arrive at their winter quarters on the Texas coast before they exult over the apparent increase in their numbers.

Four nestlings and an unhatched egg were found when the cranes' hidden breeding ground was located in the wilds of Canada's Northwest Territory May 18.

The reluctance of bird lovers to prophesy a boom in the whooping crane census due to the young ones comes from hard experience.

Since 1938, when a count on the cranes was begun, 59 young have been hatched in the North and made it safely to Texas. But in this same period, 56 old-timers died off. The count in 1938 was 18 whooping cranes. The current flock, not counting the young, is 21 cranes.

Last summer a Canadian Wildlife Service scientist spotted several whooping cranes in what is now known to be the breeding area, including one pair with one young bird. However, this fledgling never made it to Texas, and presumably died.

The winter of 1954-55 was the first in 10 years that young whooping cranes were not present in the Texas wintering ground.

The whooping crane population hit a low point in the winter of 1941-42, when only 15 birds showed up in Texas. By 1949-50, however, their number was up to 34.

What is the chance that the once numerous whooping cranes can make a comeback? It seems a slim one, but the chance is there.

Fortunately, whooping cranes do not seem to need the stimulation of a large flock in order to breed. Thus, they have a continued chance to keep reproducing in spite of diminished numbers.

Some birds can breed only when surrounded by large numbers of their kind, Herbert G. Deignan, assistant curator of birds at the U. S. National Museum, told SCIENCE SERVICE. Some sea gulls, for instance, must be actually touched by others milling around it before they will mate.

The now-extinct passenger pigeons may have reacted like this, Mr. Deignan suggested.

Whooping cranes lay an average of two eggs a season, although as many as four have been counted. In view of the small number of adults, this makes a dangerous picture, because of the natural hazards from egg to adult.

For instance, normal accidents probably kill off three out of five baby robins, Mr. Deignan estimated. This is not a risky figure, with as many robins as there are to replace their kind. But with the limited number of whooping cranes, such a mortality rate could spell the difference between survival and extinction.

Adult whooping cranes seem to be able to take care of themselves against their natural enemies. Old age and man are the greatest menaces to the survivors now.

Two of six birds lost in 1952 were found wounded by gunshots, one in Kansas and one in Saskatchewan. In spite of efforts to save them, both died.

Science News Letter, July 23, 1955

MEDICINE

First Study of Blood Usage Made

➤ BLOOD DISTRIBUTION agencies will soon be able to estimate, with far greater accuracy than at present, a region's future demand for human blood for therapeutic use. This is one of the results of the first large-scale study ever made relating blood usage to hospital size.

The study should greatly aid the distribution of an estimated 4,000,000 pints of blood to 8,000 hospitals every year.

Large general hospitals not only use more blood than small hospitals, they use more blood per bed, the new study, made by Dr. George W. Hervey, director of statistics of the American Red Cross blood program, showed.

Average blood use, per bed, rises in general hospitals as the number of beds rise, until the hospital reaches the size of 400 or more beds. The rise is probably due to the larger facilities for complicated and blood-consuming surgery in larger hospitals.

Blood use, per bed, does not continue to rise with hospital size in hospitals over 400 beds because the very large hospitals usually have many convalescent, psychiatric and tuberculous patients who need little therapeutic blood.

The 1,837 general hospitals studied used an average of 5.39 pints of blood per bed per year. Relatively few non-general hospitals were studied. Their blood use was rather unpredictable and seemed to depend more on the nature of the hospital than on its size. A huge 6,920-bed mental hospital used only 384 pints of blood in the year studied, while a hospital specializing in childbirth had only 126 beds but used 1,349 pints of blood.

Dr. Hervey's statistics will appear in the *American Journal of the Medical Sciences.*

Science News Letter, July 23, 1955

ELECTRICITY FROM WIND—The 80-foot rotor of an electric windmill, built by de Havilland Propellers Ltd. of Hatfield, Hertfordshire, England, is shown here. Blades are hollow and air is drawn up through a turbine at the bottom of a 100-foot tower to their open tips. (See SNL, July 2, p. 8.)

PHYSICS

Denver Sun Research Aids L. A. Smog Study

➤ RECORDS of how much and what kind of infrared light from the sun is absorbed in the Denver atmosphere have been kept by the Denver Research Institute for many years, to aid astronomers seeking uncontaminated air for telescope viewing.

Now a man on a roof in Los Angeles, with a similar instrument, checks that city's smog against the corresponding record of Denver's clear air to determine how much and what kind of chemicals float in the air over California's smoggy southern city.

James Brooks, staff engineer of the Denver institute, applied to Los Angeles this method of analyzing the air without collecting samples from air filters.

Absorption of infrared light, as measured by the spectrometer, reveals the kind of, and to some extent the quantity of, atoms in the atmosphere through which the light waves have passed. Different atoms absorb different wave lengths in the invisible infrared. This absorption is shown on the spectrometer record.

The difference between Los Angeles' record and the corresponding one for the same day in Denver reveals the smog particles, when allowance is made for absorption by atmospheric particles present between the earth and the sun.

Science News Letter, July 23, 1955

ENGINEERING

Houses Without Steps

Common household accidents can be reduced and life made easier through the studied efficiency of the "stepless" house for the handicapped.

By EDWARD HOUSMAN

➤ "STEPLESS" HOUSES, one-story dwellings that hug the ground, are an architectural mode for the future. They mean independence for the handicapped. They can also mean a safer, easier life for the normal person.

Advocated by the National Society for Crippled Children and Adults as the "wheel chair house" in which the handicapped can live without outside assistance, the new kind of dwelling is arousing interest among architects, builders and prospective home owners.

There are more than 23,000,000 physically handicapped in the United States, by conservative estimate. These include those crippled by polio, accidents, arthritis and other ills that affect the use of limbs.

Also, there are the older people in our population who have trouble getting up and down stairs. All of them need the stepless house.

In such homes, all floors are flush with the ground outside. There are no doorsteps or door sills. Ground level terraces replace the raised porch.

Cabinets, electrical outlets and the major storage areas are built within easy reach, even from a wheel chair.

Doors Removed

Door knobs are lowered, with the lever type preferred. Swinging doors are even easier for the wheel chair housewife to manage, but wherever possible, doors are removed completely. Architectural experts point out that most houses have unnecessary doors. The historic need for inside doors—to keep in the heat—is obsolete today.

Doorways and hallways are widened in the stepless house, with protruding furniture removed for additional safety and ease of movement.

Arrangement of the rooms and furniture is designed deliberately with an eye toward the least possible motion in accomplishing the daily chores.

It surprises some to find that one of the most important places in a wheel chair house is the garage. In almost all cases the garage is attached to the house for easy access. The car is the handicapped person's major link with the outside world. He cannot get around very well in a wheel chair, but in a car his range is unlimited.

In advanced designs, the car stands in a pit so that the person can swing into the driver's seat more easily. Garage doors open and close automatically, controlled by switches thrown from the car window.

Bathrooms and kitchens need special consideration to be functional for the handicapped. Leg room is provided under the kitchen sink and work table. Faucets are in easy reach from a wheel chair and cabinets are lowered. Protruding surfaces have convenient finger grips so the handicapped can hold themselves steady on their feet.

For persons who can walk with support, some object is always within grasp in the kitchen.

Most handicapped persons need large bathrooms. Among the common features are a lowered sink, with foot room underneath and a medicine cabinet at the side. A full-length mirror is often installed so not only the handicapped, but others can use it without discomfort. A retractable seat for the tub or shower, which may swing into the entrance for extra safety, can also be used.

Cheeriness and light is the theme for the living room, with as little obstructing furniture as possible. Large windows that open by turning a crank are recommended. This room may face a sun porch or terrace. Furniture is kept near the wall or built into the wall. Scattered pieces get in the way and make cleaning more difficult.

Easy Access to Kitchen

A dining room is built for easy access from the kitchen. The two rooms could be unified, with perhaps an archway in between, for extra convenience in serving.

General rules for the design of stepless houses, as compiled by experts on the handicapped, include:

No steps, no ramps, ground level entrances, wide passages, sliding doors on closets, a color scheme for easy cleaning, plug-in telephones, no scatter rugs and high door stops to avoid tripping.

The modern labor-saving devices, such as garbage disposers, dishwashers, clothes washers and dryers, electric mixers are recommended.

The basic feature of the stepless house, the fact that it sits right on the ground, however, makes necessary radiant heating.

The ordinary house is raised a step or two above the ground to prevent damage

STEPLESS ENTRANCE—Doorways to house and garage are built flush with the ground in B. F. Good's stepless house in Falls Church, Va. A connecting path makes for easy access to both doorways, even from a wheel chair.

from moisture. A ground-level cement slab with radiant heat to keep out the dampness is a recommended foundation for the stepless house.

The slab may continue out to the attached garage, forming a cement apron around the slightly depressed car pit. It may spread under a screened porch or patio, Nena W. Badenoch of the National Society for Crippled Children and Adults, Inc., pointed out. With an overhanging roof, no raised sill is needed at the connecting door between the house and the patio.

Designed by Occupants

Each stepless house has its own refinements, since it is designed for, and partly by, the persons who are to make it their home.

Mrs. Foster Dudley of Burlington, Wis., her legs practically useless from a polio attack, has been running her stepless household for about nine years. In her back yard there is a revolving clothes line on which she can hang the family wash by leaning against a length of pipe. Electric outlets for the vacuum cleaner are on the light switch plates to avoid bending.

Mrs. Alice Miley, another polio victim, has her telephone in an opening between the kitchen and the living-dining room so that it can be answered from either side, eliminating the rush around corners when it rings. Her husband, a World War II veteran, is also confined to a wheel chair most of the time. The kitchen in their home in Carmel, N. Y., has an ironing board that folds into the wall, on which she can work from her wheel chair.

B. F. Good's stepless house in a suburb of Washington, D. C., was built with Veterans Administration aid. It features a cement connection between the front door and the attached garage.

Architects and designers are accepting the practical experience of such persons and others who have made their lives in these homes. A survey by the National Society for Crippled Children and Adults found agreement among such families that the outer door of the house be as light and easy to manage as possible.

Bigger Hallways

Doorways, halls, bathrooms and kitchens must have enough space for free passage of a wheel chair. For those unsteady on their feet, balance provisions such as handrails in long hallways are needed. Nonskid floors are essential.

For closets and cabinets, sliding doors with handles at the right level and interior rods, racks and shelves that pull forward make these areas functional for the handicapped. For others they add ease of operation, too.

"These features of construction in the stepless house are not only for the handicapped, but also for all persons who would change the trend of accidents in the home and make modern homes safe for living and livable for the span of a man's life," the National Society for Crippled Children and Adults pointed out.

They recommend that public buildings be designed to be more readily available to the handicapped and aged who have trouble climbing stairs. Such buildings should have a major entrance on the ground level, the society said.

Easter Seal Funds

Part of the funds collected during the Easter Seal campaign goes to giving free advice to handicapped who want to build a stepless house.

The livable quality of the stepless house has different trends according to climate. In snowy regions, people like to draw their homes cozily around them. A small room such as the study then becomes the place the family and guests gather in the evening.

Another trend is a large expanse of glass separating the porch or patio from the living room, John Knox Shear, editor-in-chief of Architectural Records, said.

No matter the variations on the theme, the stepless house, a necessity for the handicapped, sets a trend for all modern living with its studied convenience.

Science News Letter, July 23, 1955

NUTRITION

Tomato Powder Made By Commercial Method

➤ YOU MAY be buying tomato juice by the bag soon.

High-quality tomato powder, which can be mixed with water to make tomato juice, can be produced by a continuous process in commercial vacuum-drying equipment, the U. S. Department of Agriculture, cooperating with the Chain Belt Company of Milwaukee, has found.

The Army Quartermaster Corps is testing the tomato powder made by the continuous process method for possible use by the military. It needs no refrigeration and is very light in weight, affording large savings in storage and transportation costs.

To make the powder, the juice is first concentrated by removing part of the water. The concentrate is dried in thin layers under special temperatures and pressures. The resulting powder is then ground up and packaged in a dry atmosphere, with a drying agent added to remove moisture after packaging.

From big juicy tomatoes, the final powder contains no more than two percent moisture.

Science News Letter, July 23, 1955

VETERINARY MEDICINE

Hog Virus Under Control

➤ A SERIOUS disease threatening the nation's swine industry has been brought under control through fast action by federal and state agencies and the livestock industry.

Less than three years ago, the virus disease, vesicular exanthema, or VE, had spread over 42 states and had hit swine herds in all major producing areas. Now the disease is chiefly limited to isolated parts of six states, the U. S. Depatment of Agriculture reported in *Agricultural Research* (July).

Key to the control of VE came when researchers discovered that it was spread mainly by feeding raw garbage to swine.

As a result, 45 state legislatures have passed laws prohibiting the feeding of uncooked garbage to swine, and the remaining states have introduced similar bills. Today, 74% of hogs fed on garbage in the United States get it cooked.

In July, 1953, the U.S.D.A. prohibited interstate movement of swine that had been fed uncooked garbage at any time in their lives. Six months later, this restriction was changed to allow movement of swine if they had not been fed raw garbage within 30 days.

This relief was necessary, the Agriculture Department said, because, at that time, on 42% of the garbage-feeding premises uncooked material was being used and satisfactory cooking equipment was difficult to obtain.

Now, however, only 17.4% do not cook their garbage and suitable equipment is generally available. After Jan. 1, 1956, the old regulation goes back into effect, the Agriculture Department has announced.

VE, although well under control, cannot be completely wiped out until all garbage fed to swine is cooked. The U. S. cannot be satisfied with anything short of complete eradication of VE, the Department said.

Science News Letter, July 23, 1955

GEOLOGY

"Wonderland" Found In New Zealand

➤ PERFECT stalactites, as thin as straws and untouched by man, have been found in a cave on North Island, New Zealand.

The world-famous glow-worm caves at Waitomo have been surpassed by the new cave discovered only seven miles away.

Explorers describe the new find as "New Zealand's best underground wonderland." In contrast to the thin stalactites, there are massive stalagmites, in some instances rising 40 feet from the floor of the cave.

Science News Letter, July 23, 1955

Special ceramic-base *brake lining* designed to meet the searing heat of high-speed aircraft brakes is now being manufactured as lining for industrial and automotive clutches.

BOTANY

Peanuts and Tulips Yield New Chemical Nutrients

➤ THE PEANUT, the tulip and the fern have yielded new information of scientific value in agriculture, nutrition and biochemistry, explaining how plants make use of nitrogen.

In addition to the amino acids making up the well known proteins, a whole new array of nitrogen compounds in plants has been discovered by the new process of chromatography. These compounds, although known to chemists, were not recognized previously as occurring in plant tissues.

Recent advances in identifying these compounds have come so fast that scientific publication cannot keep up with them, Prof. F. C. Steward of the department of botany at Cornell University, Ithaca, N. Y., reported. Airmail letters exchanged with scientists in Finland, England, Australia and South Africa are constantly bringing news of additional materials of the new types, found in plants of different kinds.

One of the new compounds, known to chemists as gamma-methylene-glutamine, was discovered independently, by different groups of scientists, in peanuts and in tulip bulbs.

A third source, the growing tip of the maidenhair fern, discovered by research groups of both Harvard and Cornell Universities, gives unusually large quantities of the glutamine chemical, aiding in its chemical identification.

Working with Prof. Steward in this study, reported in *Nature* (April 23), were Drs. N. Grobbelaar and John K. Pollard of Cornell University.

Science News Letter, July 23, 1955

ENTOMOLOGY

USDA Tightens Controls On Pink Bollworm

➤ FARMERS OF the cotton states are girding themselves for battle with the world's worst cotton pest, the pink bollworm.

The U. S. Department of Agriculture on July 12 ordered all infested areas of six southwestern states to be merged into a single regulated area, because of increasing build-up of the pink bollworm.

Until 1952, heaviest concentrations of the destructive insect were centered in Texas along the Mexican border, and the entire infested region was divided into "heavily" and "lightly" infested areas. The USDA order abolished this division and, at the same time, 20 Arkansas counties were added to the regulated area.

The regulated region now includes all of Texas and Oklahoma and parts of Arizona, Arkansas, Louisiana and New Mexico.

Although the pink bollworm, *Pectinophora gossypiela*, established itself in the Lower Rio Grande Valley in 1936 and has extended its range steadily since then, its usually devastating effects on cotton have been kept down by rigorous cultural control practices and quarantine.

The pink bollworm is generally established throughout all the major cotton producing countries except Mexico and the United States, where it has been kept bottled up as well as possible. In Egypt and India, this bollworm has accounted for 15% to 25% of cotton losses. The insect pest was so bad in the U.S.S.R. in 1933 that Russian entomologists came to the United States to study control methods.

The preferred food of the pink bollworm larva is the kernel of the cotton seed. To reach it, he tunnels his way through the cotton boll, ruining the lint as he goes. Once inside, he devours one seed after another, and may reduce oil content from cotton seed as much as 20%.

Science News Letter, July 23, 1955

AERONAUTICS

Animals Hazard in Airplane Piloting

➤ ANIMALS are a hazard to flying airplanes. Reports reaching the Civil Aeronautics Administration show that birds, which collide with airplanes in the United States at the rate of about one smack per week, are not the only wild life involved in such aviation mishaps.

Other creatures troublesome to pilots include heifers, deer, jackrabbits, mice, gophers and lions.

The wide open, level spaces of the modern airfield attract herds of deer, forcing some airports to build special fences to keep the animals out. Gophers apparently take great pride in digging holes on paved runways where planes can catch their wheels in them.

In the spring, the spacious air intakes of engines and cozy exhaust pipes are favorite nesting places for birds, thus forcing the ground crew to plug exhausts and cover engines overnight. Doing this, however, does not prevent field mice from eating holes in wooden structures. One airport in Canada was even infested with ducks and appealed to the CAA for advice.

A CAA safety agent in Indiana tells of a farmer whose prize heifer wandered into a field of "chest deep" wheat. A friend with a Piper Cub agreed to fly over the field and dive low over the heifer to point the animal out. He dived and the farmer headed for the spot. He dived again. By this time the heifer began wondering what all the fuss was about and raised her head high just as the plane came in for a third low dive. Her head hit the landing gear.

According to the report, the plane was demolished, the pilot emerged with a cut lip and the "heifer died of either a broken neck or heart failure."

In Africa a marauding lion made armed guards necessary at one landing strip.

Birds fly so frequently into commercial craft that the CAA now requires bird-proof windshields on planes.

Science News Letter, July 23, 1955

IN SCIEN

PHYSICS

Atom Studied in Australian Cliff Cave

➤ NUCLEAR PHYSICISTS at Sydney University, Australia, are moving into a laboratory 110 feet underground, an old wartime searchlight gallery on the cliffs at Sydney Harbor's South Head.

Under the direction of Dr. Paul George, chief of research, and Dr. Harry Messel, professor of physics, the scientists are moving $125,000 worth of equipment underground.

For the next three years, they will conduct underground experiments aimed at learning about nuclear matter.

Because the scientists require only high-energy mesons for their studies, they will use the 110 feet of rock and earth as a filter to stop the low-energy particles.

Their equipment will include two electromagnets weighing 25 tons, a cosmic ray spectrometer, sensitive Geiger counters, automatic cameras and a cloud chamber.

Other laboratories for similar research have been established in England and Italy.

Science News Letter, July 23, 1955

EDUCATION

Left-Handed Children Need Writing Help

➤ LEFT-HANDED CHILDREN need special guidance while still in the "scribbling stage," and the help that parents give them in this preschool period can make writing easier later on.

This is the advice of Dr. Norma V. Scheidemann, psychologist on the summer faculty of the University of California at Los Angeles.

Dr. Scheidemann, who has studied left-handedness for many years, points out that our system of writing, progressing from left to right with predominantly counter-clockwise rotary movements, capitalizes on the directional movements easiest for the right-handed.

Parents of a young left-handed child can smooth the way for his later school years by helping him reverse his natural "scribble" pattern of right to left and clockwise rotary movements.

This can be done by guiding the child's hand, first in drawing bold sweeping strokes and large continuous loops from the left edge of the paper to right; later in making more carefully controlled lines, broken and dotted lines, and in smaller loops and rings.

Without this preschool practice children may establish directional movement habits making writing difficult.

Science News Letter, July 23, 1955

CE FIELDS

ENTOMOLOGY

Mite Spreads Costly Peach Disease

➤ ENDING a 17-year search, a microscopic mite has been pegged as the carrier of a disease that has cost peach growers 400,000 trees, valued at $10,000,000, the U. S. Department of Agriculture announced.

Credit for tracking down the tiny spreader of peach mosaic disease was given to entomologists Laurence S. Jones and Norton S. Wilson and plant pathologist L. C. Cochran of the U.S.D.A.'s Agricultural Research Service, Riverside, Calif.

This scientific team found that within two weeks after they transferred the mites from diseased peach trees in an orchard to isolated, healthy trees in a greenhouse, the healthy trees showed symptoms of infection.

Until now, the only effective control possible for the peach disease was removal and destruction of diseased trees. Discovery of the mite as carrier of the disease offers new and easier control possibilities, perhaps through insecticides.

The exact identity of the mite has not yet been determined. It may be a new species.

The investigators first found the mite beneath the scales of retarded leaf buds. As shoot growth pushed from the buds, loosening the scales, the mites were picked up and wafted about the orchard by air currents.

Peach mosaic disease has been a major problem to orchardists in eight western and southwestern states for over 20 years. The disease also attacks plums, nectarines, almonds and apricots.

Science News Letter, July 23, 1955

GEOLOGY

X-Rays Aid Search For A-Bomb Minerals

X-RAYS PROVIDE geologists with an ultra-fast search aid to help them keep pace with electronic prospecting for atomic energy minerals.

The use of X-rays for assaying was described by two Government scientists who developed a technique for determining the percentage of radioactive thorium in an ore sample.

Thorium can be converted into fissionable uranium 233 for use in A-bombs and atomic power plants.

The electronic assayer is known as an X-ray spectrometer, and the technique, which can be applied to most minerals, is called fluorescent X-ray analysis.

In operation, an ore sample is mixed with selenium, a non-metallic element resembling sulfur. The amount of selenium is known. The mixture is then subjected to a beam of X-rays, which gives off secondary X-rays whose intensities are recorded.

The intensities of the X-rays are then compared and the percentage of thorium in the sample determined.

This method of assaying is seen as cutting time of chemical analysis from as long as two days in the past to a matter of minutes.

Reporting use of selenium in thorium analysis in *Science* (July 8), were Alan G. King and Pauline Dunton of the U. S. Geological Survey, Denver, Colo.

Science News Letter, July 23, 1955

AERONAUTICS

Lying While Flying In British Jet Plane

➤ THE BRITISH Ministry of Supply in London is experimenting with an airplane built for two, with one pilot sitting and the other lying down.

A Meteor jet fighter has been modified so that a bed-like cockpit is installed in its nose. One pilot lies in the prone position in this cockpit, and the other pilot sits upright in the regular Meteor cockpit.

Either pilot can take over control of the airplane when desired. The craft was designed to test the advantages and disadvantages of lying while flying.

Science News Letter, July 23, 1955

ANIMAL PSYCHOLOGY

Judgment of Light Aids Brain Studies

➤ CERTAIN BRAIN disorders may be diagnosed more accurately some day because of a cat that likes "bright lights" and good food.

Aided by a device developed by Dr. Ralph Gunter of the biophysics department of the University of California at Los Angeles Medical School, the cat has learned to associate hunger with light.

The device contains two small windows through which light intensity can be varied. The cat learns to get food by going to the window with the brighter light. Over a period of time, light intensity at the two windows is made more equal until the cat is then re-tested for its ability to associate the different degrees of brightness with its food.

At this point in conditioning, tiny portions of the cat's brain are removed. The cat is then re-tested for its ability to associate the different degrees of brightness with its food.

The U.C.L.A. scientist hopes to pinpoint the brain areas controlling particular visual functions. This information might be used by brain specialists to determine, through visual symptoms, the location of brain tumors and to aid in diagnosis of other brain disorders.

Science News Letter, July 23, 1955

PSYCHOLOGY

Lie Detector Itself May Lie About Person's Lies

➤ AN UPWARD swing of the record of a lie detector, or polygraph, may point to innocence, not guilt. So warned Richard O. Arther, of the New York Laboratory of John E. Reid and Associates, New York.

This instrument is sometimes used by police in crime investigations. It makes a record of a suspect's blood pressure and breathing rate as he answers a series of questions about the crime and others which are not "loaded."

Investigators have thought that if the questions about the crime caused a sudden rise in blood pressure, that would point to the suspect's guilt. Such a rise may indicate just the opposite, Mr. Arthur reported in the *Journal of Criminal Law, Criminology and Police Science* (May-June).

He suggested certain tricks to avoid being misled by lie detector records. One is to ask a question about a purely fictitious "crime." If the suspect's blood pressure goes up when he answers this question, as well as the question about the real crime, innocence is indicated.

If the suspect's blood pressure goes up in response to a control question — about whether he has been guilty of any other crimes — and the rise at this point is greater than the rise on questions related to the crime being investigated, this is strongly indicative of truth telling.

If the suspect's breathing is normal on the crime questions but speeds up on the control questions, this is suggestive of truth telling, even though the blood pressure record would otherwise point to guilt.

Science News Letter, July 23, 1955

PUBLIC HEALTH

Chemical Sterilizes Hospital Blankets Easily

➤ HOSPITAL BLANKETS that may harbor and spread disease from patient to patient can be sterilized easily in a low-temperature wash by using the chemical Cirrasol OD, two English scientists have found.

Robert Blowers, director, and K. R. Wallace, assistant bacteriologist, of the Public Health Laboratory, Middlesbrough, laundered blankets from hospital beds in a washer using a non-ionic detergent for cleaning. The blankets were rinsed, then washed again in water to which Cirrasol OD (cetyl trimethylamine bromide) was added. Other blankets were laundered in the routine way, using only an anionic detergent.

The blankets washed with Cirrasol OD were found to have only occasional bacteria on them, while the blankets laundered routinely showed a high bacterial count.

Washing with Cirrasol OD left the blankets normal in appearance and texture and odorless, the scientists reported in *Lancet* (June 18).

Science News Letter, July 23, 1955

GENERAL SCIENCE

How To Keep Cool

Scientists have some new pointers on this perennial summer problem. Things to do about the heat range from how you build your house to the salt cellar on your table.

By JANE STAFFORD

➤ SCIENCE CAN help you beat the heat in many ways, even if you have to spend most of the hot summer living and working in the city.

Some new findings will give you pointers on hot weather diets. You do not have to live on salads and sandwiches. In fact, you may be hotter if you limit your daily fare to those items.

No need, either, for most of us to salt our food excessively in hot weather. New findings about the body's handling of salt show why.

Homes can be made cooler in many ways. Air-conditioners help, of course, but there are even such simple cooling devices as light instead of dark colored shades at windows.

Many of you have probably thought that in hot weather you should avoid fats and fatty foods and eat a diet made up largely of salads and carbohydrates, that is, sugars and starches. That idea is wrong, Dr. Robert S. Harris of Massachusetts Institute of Technology, Cambridge, Mass., said.

He explained that during the digestion and utilization of foods, a significant amount of energy is expended. This is called the "specific dynamic action," or S.D.A. for short. This S.D.A. energy is given off in the form of heat. When fed alone, 32% of the calorie value of beef protein was expended as S.D.A. experiments showed. When dextrose sugar was fed alone, 20% of its calories went into S.D.A. With lard, the value was 16%.

When the three foods were mixed, however, the S.D.A. was less than that computed from each alone. A mixture of equal parts of beef protein and lard required only 11 calories for S.D.A., rather than a calculated 24, or a reduction of 52% in the energy expense. Dextrose plus lard led to an economy of utilization of 35%, and dextrose plus protein plus lard led to a 22% economy.

Fats Aid Cooling

In mixed diets, carbohydrate is the major heat producing factor, while lard and other fats are major factors in giving economy of utilization.

"Thus a person will be hotter on a high carbohydrate diet than on a diet of equal calorie content which is rich in fat," he told the National Association of Margarine Manufacturers recently.

The anti-heat producing effects of fat in mixed diets have not been explained yet. But the experimental evidence showed that you will be hotter, not cooler, on a diet rich in starches and sugars, and that fats counteract this.

You have probably heard that your body needed more salt in hot weather. Many take to salting their food heavily in summer and some even take salt tablets. Unless you do hard labor on very hot days, however, you do not need extra salt.

New findings on how the human body's salt balance is maintained in hot weather, which support his view that people may easily eat more salt than they need, were reported by Prof. Sid Robinson of Indiana University at a meeting of the American Physiological Society.

Normal Salt Sufficient

Except for a few first days of hot weather, most persons get enough salt in normally seasoned food, without an extra ration, Prof. Robinson said. Too much salt puts extra work for its elimination on the kidneys and sweat glands, he pointed out.

The sweat glands and kidneys change their output of salt to maintain the normal concentration of salt in body cells, he found. If the salt concentration falls too low, physiological disturbances such as heat cramps may result. His tests of men walking on a treadmill in high temperatures help to clear up apparent contradictions in reported results from less extensive studies.

He found that the response of the sweat glands and kidneys in speeding up or retarding salt secretion are all what might be expected in order to maintain a normal salt concentration, but that a time factor is involved. Failure to recognize this time factor has resulted in previous confusion of results.

Less Salt in Sweat

The kidneys begin their salt conserving responses to salt deficiency in one to two hours and complete them in five or six hours. The sweat glands are much slower, responding in eight to 24 hours and requiring several days for the complete response. But, after a few days of sweating, without full replacement of salt losses, a man is "acclimatized," and his sweat contains little salt.

Sweating is one of the ways the body cools itself. Evaporation of the sweat takes away heat. To make the most of this natural cooling mechanism, you should dress suitably. Wear clothing of porous material. White and light colors in clothing will help you beat the heat by reflecting it away from your body.

HOT WEATHER FUN—This is a favorite way to beat the heat followed by all who are fortunate enough to get to a lake, ocean or swimming pool.

Remember the point about light reflecting the heat when you are trying to cool your home. A light-colored roof, for example, will make the house cooler than a black- or dark-colored one. A fully drawn, light-colored roller shade at the window is 55% effective in reducing heat load, but a dark shade is only 20% effective.

Hang your Venetian blinds on the outside of the windows if you can. The Small Homes Council at the University of Illinois reports that light-colored Venetian blinds outside the house are 70% effective in reducing heat load, but only 40% effective inside the house.

Trees, Awnings Help

The Council also advises that sunlight should be prevented from beating down on house walls and windows where possible. Trees, overhangs, window louvers or blinds, awnings, louver-type insect screens and light-colored walls all can help offset the onslaught of a blistering summer sun.

If you are building a new home or trying to make the old one cooler, you can get other practical ideas, including some on air conditioning, from the Council's bulletin on summer comfort.

Frequent bathing with cool or lukewarm water that is allowed to dry off the skin instead of being rubbed off will cool and refresh you in hot weather.

Iced tea and coffee are favorite hot weather beverages for many, but some prefer these hot with the idea that the perspiration induced by the drinks helps in cooling the body.

Eat Well, Get Your Rest

Even if your appetite falls off on very hot days, remember you need the energy from food. Many a person feels exhausted because he has eaten so little that his energy stores are depleted.

You can stand the heat better, too, if you get enough rest. When the nights are too hot for sleeping more than a few hours, try to get an extra rest in the daytime, at least on week-ends and holidays. If you cannot take a noon-day siesta, try for one before your evening meal.

A brief afternoon nap is not the refuge of the lazy but the premium a wise man pays for a long life, said Dr. Clarence A. Mills, University of Cincinnati expert on the effect of climate and weather on man and professor of experimental medicine.

Ten minutes of sleep will do it. A short nap is better, Dr Mills said, than a long slumber which makes one groggy

Science News Letter, July 23, 1955

• RADIO

Saturday, July 30, 1955, 5:00-5:15 p.m. EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Elmer H. Loughlin, associate clinical professor of medicine, New York Medical College, will discuss "How to Travel and Stay Healthy."

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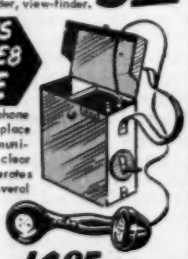

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Books of the Week

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APPLICATION OF DIMENSIONAL ANALYSIS TO THE RELATIONSHIP BETWEEN VELOCITY OF SOUND AND PHYSICAL PROPERTIES IN ORGANIC LIQUIDS—Dudley Thompson and N. N. Bakhshi—*Virginia Polytechnic Institute*, Engineering Experiment Station Series No. 100, 26 p., paper, 25 cents.

THE AXIAL VARIATION OF THE MAGNETIC FIELD IN SOLENOIDS OF FINITE THICKNESS—Dillon E. Mapother and James N. Snyder—*University of Illinois Engineering Experiment Station*, Circular No. 66, 93 p., illus., paper, $1.00. Report of an investigation conducted by the Experiment Station in cooperation with the U. S. Army Office of Ordnance Research. Presents tables, compiled with the aid of an electronic computer, to aid in designing solenoids.

BIBLIOGRAPHIC SURVEY OF CORROSION 1950-1951: A Compilation of Corrosion Abstracts—*National Association of Corrosion Engineers*, Publication No. 55-4, 435 p., $12.50. Includes 4,454 abstracts from some 500 periodicals and books.

CHILD DRAMA—Peter Slade with a Foreword by Dame Sybil Thorndike—*Philosophical Library*, 379 p., illus., $10.00. Pointing out that there exists a child drama, an art form in its own right, displayed even in early infancy.

COLLEGE CHEMISTRY: An Introductory Textbook of General Chemistry—Linus Pauling—*Freeman*, 2d ed., 685 p., illus., $6.00. In this new edition an attempt has been made to increase the clarity and to add to the amount of organic chemistry covered.

CORN AND CORN IMPROVEMENT—George F. Sprague, Ed.—*Academic*, 699 p., illus., $11.50. Emphasis is on the present state of our knowledge of corn growing.

FIG VARIETIES: A Monograph—Ira J. Condit—*California College of Agriculture*, 216 p., illus., paper, limited number free upon request direct to publisher, Agricultural Publications, Room 22, Giannini Hall, Berkeley 4, Calif. The Mission fig of California was introduced over 400 years ago by Spanish explorers and had previously been propagated in Spain for many centuries.

INTRODUCTION TO PARASITOLOGY: With Special Reference to the Parasites of Man—Asa C. Chandler—*Wiley*, 9th ed., 799 p., illus., $8.50. An introductory textbook that includes coverage of parasites important in veterinary medicine.

MATERIAL AND LABOR ANALYSIS, HOUSE FRAMING SYSTEMS—Joseph H. Orendorff, director—*Govt. Printing Office*, Housing and Home Finance Agency, Housing Research Paper No. 33, 125 p., illus., paper, 65 cents. Reporting investigations designed to provide comparative figures on various framing practices.

MEET THE SCIENCES: A Booklist for the General Reader—Science Committee—*New Jersey Library Association*, 5th ed., 6 p., paper, 10 cents. A selection of readable books on various aspects of science.

NEW METHODS IN ANALYTICAL CHEMISTRY—Ronald Belcher and Cecil L. Wilson—*Reinhold*, 287 p., illus., $5.50. A compilation of newer methods based on classical techniques.

OPERATION MOON—R. Will Burnett—*Science Research Associates*, 48 p., illus., paper, 50 cents. Intended for high-school readers, describing the problems of space travel.

PHOTOGRAPHY HANDBOOK—Joseph Daffron, Ed.—*Arco*, 144 p., illus., $2.00. A book of practical hints and instructions for the camera fan.

PLANTS WITHOUT FLOWERS—Harold Bastin—*Philosophical Library*, 146 p., illus., $6.00. Describing an inconspicuous part of the plant kingdom that, nevertheless, has a great importance in industry and agriculture as well as in medicine.

PRACTICAL PHYSICS—Marsh W. White, Kenneth V. Manning and Robert L. Weber—*McGraw-Hill*, 2d ed., 484 p., illus., $5.50. An introductory textbook with a whole section devoted to experiments.

SCHOLARSHIPS, FELLOWSHIPS AND LOANS: Volume III—S. Norman Feingold—*Bellman*, 471 p., $10.00. Contains a section on planning your career and a list of scholarships and student aids, arranged alphabetically.

STRESSES AROUND MINE OPENINGS IN SOME SIMPLE GEOLOGIC STRUCTURES—R. D. Caudle and G. B. Clark—*University of Illinois Engineering Experiment Station*, Bulletin No. 430, 42 p., illus., paper, 65 cents. Concerned with the rock stresses existing before the introduction of mine openings and those resulting from the introduction.

TV MANUFACTURERS' RECEIVER TROUBLE CURES: Volume 7—Milton S. Snitzer, Ed.—*Rider*, 128 p., illus., paper, $1.80. Cures offered by the makers themselves for troubles they foresee may arise in their products. This volume covers sets from General Electric to Raytheon.

TV REPAIR QUESTIONS AND ANSWERS ON VIDEO CIRCUITS—Sidney Platt—*Rider*, 128 p., illus., paper, $2.10. To help the technician in troubleshooting.

THIS WORLD OF OURS—Abram Glaser—*Philosophical Library*, 492 p., $5.00. Outlining what the author considers basic in respect to both the physical aspects of the world and world culture and development.

TRANSPLANTATION OF TISSUES: Cartilage, Bone, Fascia, Tendon, and Muscle—Lyndon A. Peer—*Williams & Wilkins*, Volume I, 421 p., illus., $13.50. The author is a combination of practical surgeon and research scientist, and is the inventor of diced cartilage grafts.

TREATISE ON INVERTEBRATE PALEONTOLOGY: Part E, Archaeocyatha and Porifera—Raymond C. Moore, Ed.—*Geological Society of America and University of Kansas Press*, 122 p., illus., $3.00. Nearly 150 specialists are contributors to this treatise, prepared under the guidance of a committee of paleontologist societies in England.

VETERANS OF THE ROAD: The History of Veteran Cars and the Veteran Car Club of Great Britain—Elizabeth Nagle, Technical data by Dennis Field, foreword by S. C. H. Davis—*Arco*, 239 p., illus., $3.75. A book to delight the old-car enthusiast.

Science News Letter, July 23, 1955

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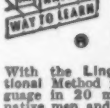
INVENTION

Riding-Horse Tricycle Receives Patent

CHIDREN WHO like ponies and horses may take to the invention of Patrick A. Madden of Philadelphia. He developed a sectional horse that clamps to a tricycle frame in such a manner that the child can be seated on a horse while riding the tricycle. It is so constructed that a child can assemble it or take it apart. Patent No. 2,711,325 was granted to Mr. Madden.

Science News Letter, July 23, 1955



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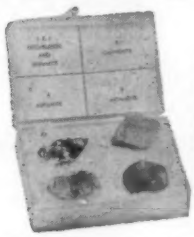

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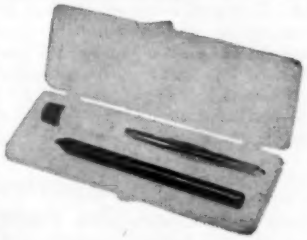

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ASTRONOMY

Russians Name Three Minor Planets

➤ THREE MINOR planets, or asteroids, discovered by the Russian astronomer G. N. Neujmin nearly 20 years ago will now be known by name instead of by the year of their discovery.

Following international custom, Dr. Neujmin picked the asteroids' names.

The minor planet 1936 FC will now be called Lomonosowa, in honor of the first famous Russian physicist and astronomer, Mikhail Vasilevich Lomonosov, who died in 1765.

Another asteroid previously called 1936 QA will be known as Idelsonia, so named in honor of the late well-known Soviet astronomer, N. I. Idelson.

The third minor planet, once known as 1938 HC, wil now be called Postrema, which signifies the last link or the last of a group, and is assigned to the last minor planet discovered by Dr. Neujmin which has been numbered.

Mrs. N. Yakhontova of the Institute of Theoretical Astronomy in Leningrad, USSR, submitted the names to the Cincinnati Observatory, the world's minor planet center.

Asteroids are thought to be fragments of an exploded planet that once swung around the sun between the orbits of Mars and Jupiter. Although star-like in appearance, they are actually hunks of dead matter shining by the sun's reflected light.

The first asteroid to be discovered was found on Jan. 1, 1801. Since then about 1,500 have been named by their discoverers. The earlier asteroids were named after mythological creatures, but the legendary lore of most lands is now pretty well exhausted.

Science News Letter, July 23, 1955

METALLURGY

Hidden Rust in Autos Is More Destructive

➤ A DIFFERENT type of rust forms in the crevices and difficult-to-reach areas of a car than on the surface where paint has chipped or scraped off.

A rust analysis by three General Motors scientists showed that the corrosion in sheltered areas of the auto body is by far the more insidious. This rust contains between 80% and 90% magnetite and 10% to 20% ferric oxide hydrates. It is a porous rust and conducive to further corrosion.

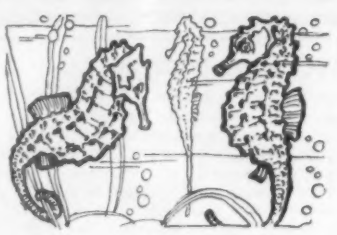
Rust on the outside of the car is principally composed of ferric oxide hydrates that retard further rust formation, J. C. Holzwarth, R. F. Thomson and A. L. Boegehold told a meeting of the Society of Automotive Engineers in Detroit. The washing action of rain and the quick and complete drying afterward aid formation of the protective rust.

Science News Letter, July 23, 1955

ICHTHYOLOGY

NATURE RAMBLINGS

by Horace Loftin



Hen-Pecked Fish

➤ ONE OF nature's most devoted fathers is the male sea horse—and with good reason. For it is the male sea horse that has the babies

During mating, the female deposits her eggs in a pouch on the underside of the male's tail. He carries the developing eggs about with him in the distended pouch for several weeks. On the happy day, the sea horse may have up to 400 "colts," about the size of this (,) comma.

After that, though, the sea horse thinks he has done enough, and leaves the young to fend for themselves. A relative of the sea horse, the Florida pipefish, *Siphostoma floridae*, does a better job. He keeps his young in a pouch in the same way a mother kangaroo does.

The female pipefish deposits her eggs in the male's pouch, as with the sea horses. After hatching, the small fry swim out at will, but return to the pouch when they are frightened.

From the female's point of view, probably the ideal arrangement is that between papa *Photocorynus spiniceps* and mama *Photocorynus spiniceps*. This species of angler fish lives in the great depths of the ocean. There, in the semi-darkness, it is conceivable that papa might be hard to find when mama wanted him. She has taken severe steps to see that this does not happen.

In effect, the male has been reduced to the status of a parasite, attached directly to the flesh of the female. The male gets all his nourishment directly from the female's bloodstream.

She must be pretty stingy with her blood, though. While she may grow to be 40 inches or longer, the male never gets much over four inches.

Science News Letter, July 23, 1955

GEOLOGY

Arctic Circle Mine

➤ IN THE frozen no-man's land of East Greenland, a Danish mining company is preparing to open a lead and zinc mine, 140 miles north of the Arctic circle.

The average annual temperature in this region is 16 degrees Fahrenheit, and winter storms often cover the land with 15 feet of snow. In spite of all obstacles, the mining company plans to open the mine by the spring of 1956. Preparations began in 1952.

A mining town, Mesters Vig, has been built near the site. The people who live there are the only inhabitants for hundreds of miles. The town was specially built, with a central plant to heat all the homes.

The water necessary for the mine's operation will be pumped through electrically heated pipes from a nearby river. Heated pipes are necessary because the ground stays permanently frozen for hundreds of feet below the surface.

Shipment by boat is blocked during ten months of the year because the coastal waters freeze over and, therefore, the mining company is building an air strip so that mail, supplies and spare parts could be landed.

Blasting into the side of the mountain to be mined will begin soon. In rooms cut out of the mountain in this way, the valuable concentrates will be separated from the rest of the ore. Natural insulation from the mountain plus heat from machinery will keep the rooms at a fairly comfortable temperature.

The lead and zinc to be mined are in deposits of galena and sphalerite scattered through a vein of quartz.

Mining experts estimate that 20,000 tons of concentrates will be shipped from Mesters Vig each season after the mine opens.

Science News Letter, July 23, 1955

CYTOLOGY

Experiments Throw Light On Fungus Diseases

➤ THE IDEA that mushrooms, mildews, rusts and other fungi have little need for light has been contradicted by U. S. Department of Agriculture scientists. Many fungi, experiments showed, need light to start spore formation, the way in which fungi reproduce asexually.

This discovery may aid scientists in finding out how plants respond to light, a long-time puzzle.

Scientists have previously thought fungi did not need light because they had no chlorophyll, the green material that enables plants to use sunlight for growth. Now studies have shown that, although the fungi may not use sunlight for growth, their life processes are somehow accelerated or inhibited by light conditions.

Science News Letter, July 23, 1955

SURGERY

Hope for the Childless

Enlarging constricted heart valves permits women who formerly could not stand burdens of pregnancy to bear children safely. Operation cuts need for therapeutic abortions.

➤ AN OPERATION to enlarge constricted heart valve openings offers new hope to childless couples who have feared pregnancy because of rheumatic valvular disease in the wife, a team of Philadelphia physicians reported in the *Journal of the American Medical Association* (July 16).

Organic heart disease, usually rheumatic, accounts for about 25% of all maternal deaths today. The operation, mitral commissurotomy, gives promise of decreasing morbidity and mortality in the pregnant patient, the doctors said.

Drs. Robert P. Glover, Donald E. McDowell, Thomas J. E. O'Neill and O. Henry Janton, from the department of thoracic and cardiac surgery, Presbyterian, Episcopal, Lankenau and Hahnemann Hospitals and the Department of Cardiology, Presbyterian Hospital, made the report.

Use of the heart operation in cases where this treatment is indicated can decrease the necessity of induced abortions in pregnant women suffering from narrowing of the mitral valve opening, or mitral stenosis, also.

Cardiac cases account for 30% to 40% of therapeutic abortions now, they said, and about 85% of these are in cases of pure mitral stenosis or combined lesions due to rheumatic infection, which are helped by the operation.

Pregnancy throws an increased burden on the heart, and by the 32nd week, the heart's output is 40% to 50% above normal, putting too great a strain on hearts already weak.

The doctors reported the cases of five mitral commissurotomies performed on pregnant women. One patient was operated on at one month of gestation, two at six weeks, one at three months and one at six and a half months. Two of the patients had suffered cardiac failure before the operation and two had mild attacks.

Since commissurotomy, none of them has had cardiac failure. One patient had a spontaneous abortion six weeks after the operation, but the other four safely delivered normal children.

From these cases the doctors conclude that mitral commissurotomy may be safely carried out during pregnancy without harm to mother or fetus. Further, the patients appear to be greatly benefited, and in each case, therapeutic abortion was avoided.

Science News Letter, July 23, 1955

PSYCHOLOGY

Play Is Psychic Vitamin

➤ PLAY IS a "psychic vitamin," a psychiatrist reported to the *American Journal of Psychiatry* (July).

Just as lack of vitamins in human nutrition causes deficiency disease, so lack of play in a child's life, he said, may cause a neurosis to develop.

Five kinds of neurosis can develop in children, reported Dr. F. Schneersohn, director of the Mental Hygiene Clinic, Tel Aviv, Israel. They are home neurosis, loneliness neurosis, school neurosis, street neurosis and stranger neurosis.

Children suffering from home neurosis (and adults, too) can control their abnormal behavior and conceal their neurosis when they are away from home or when strangers arrive. When home alone with the family, they are unconstrained and give full rein to their nervous irritability.

Children with school neurosis suffer the opposite condition. While alone with their family, they feel secure and relaxed and behave normally.

Any neurosis may develop if a child cannot play naturally. The neurosis tends to fill life's unbearable emptiness.

The remedy is to fill the child's day with needed play activity.

Dr. Schneersohn also suggested lack of the play vitamin may cause delinquency.

"Without play the child becomes depressed and indolent," Dr. Schneersohn said. "He does not know what to do with himself. Antisocial or morbid tendencies which he could normally subdue appear, unrestrained. Driven by an inner urge, the child now 'exploits' such antisocial inclinations in order to fill the intolerable vacuity."

Science News Letter, July 23, 1955

AERONAUTICS

Probe-and-Drogue Refueling Method

See Front Cover

➤ A NORTH American AJ Savage tanker-aircraft refuels a Chance Vought F7U Cutlass in flight, using the probe-and-drogue method of refueling, in the photograph on the cover of this week's SCIENCE NEWS LETTER.

Refueling in air is used to extend an airplane's range. More than 142,000 air refueling hookups were made by the Strategic Air Command in 1954.

Science News Letter, July 23, 1955

Questions

AGRICULTURE—What are the background of Russian farm leaders visiting the United States? p. 50.

□□□

ENGINEERING—How can many common household accidents be reduced? p. 54.

□□□

GENERAL SCIENCE—How do fats affect the body's cooling system? p. 58.

□□□

PSYCHOLOGY—What actions are police advised not to take with mentally ill people? p. 52.

□□□

WILDLIFE—Why is an increase in whooping cranes still not assured? p. 53.

□□□

ZOOLOGY—What is the life expectancy of a caribou? p. 55.

□□□

Photographs: Cover, U. S. Air Force; p. 51, North American Aviation, pp. 50 and 53, British Information Services; Inc.; pp. 54 and 58, Fremont Davis; p. 64, Nuclear Instrument and Chemical Corporation.

ENGINEERING

Loud Speaker Without Vibrating Membrane

➤ ENGINEERS in Hanover, Germany, are perfecting a loud speaker that has no vibrating membrane. Instead, it uses a pocket of ionized air to obtain higher fidelity.

An ordinary loud speaker has a cone-shaped membrane that excites nearby air to create a sound. The inertia of this cone causes distortions in reproduction. The vibrating pocket of air in the new loud speaker, called the Ionophone, will create the sound without this setback, the designers say.

The Telefunken Company in Hanover hopes to develop a commercial model of the device, invented by M. S. Klein of Paris.

Science News Letter, July 23, 1955

Understanding Yourself

By Dr. Ernest R. Groves

This inspirational book, *now in its well-merited 8th printing*, has helped thousands to live more wisely, more fully, more happily, more effectively—in the best sense, more profitably; for a thorough understanding of self is the very bedrock foundation on which to build for peace of mind and sound mental health.

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⚙ *PORTABLE TORCH permits you to have the soft and unusual lighting of an open flame wherever you go: at the beach, at barbecues, or in your own backyard or patio. In green metal or copper models, the torch, which uses kerosene, is installed on a pole which may be pushed into the ground wherever light is desired.*

Science News Letter, July 23, 1955

⚙ *CURRENCY CALCULATOR permits travelers to tell at a glance what their dollars are worth in 26 foreign exchanges. Operating like a verb wheel, the compact guide is made of a rigid sheet-plastic that resists dirt, moisture, cracking and aging.*

Science News Letter, July 23, 1955

⚙ *TRI-COLOR FLASHLIGHT signals in red, green or white light. Especially designed for hunters, campers, and sportsmen, the unit has an attachment for carrying on belts.*

Science News Letter, July 23, 1955

⚙ *SLINGSHOT RELOADS automatically for quick firing. After each shot, Junior places the firing pouch under the hollow handle of the gadget, and presses a button which drops one pellet into the sling. The handle holds 500 pellets.*

Science News Letter, July 23, 1955

⚙ *URANIUM DETECTOR, shown in the photograph, is designed for aerial prospecting from a small plane. The detector, a scintillation system, weighs less than 75 pounds, features low power consumption, and has an alarm that signals pilot and observer if any unusual radioactivity is detected.*

Science News Letter, July 23, 1955

⚙ *CASTING FLOAT contains a spring that jerks the line, setting the hook in the fish as soon as he bites. For more effective casting, the weight of the float is concentrated in its base near the sinker.*

Science News Letter, July 23, 1955

⚙ *BARBECUE MOTOR is a portable gadget that operates on two flashlight batteries and easily attaches to any type of grill or brazier. Strong enough to turn heavy roasts, the gadget is useful at the beach, on hunting and fishing trips, or in your own backyard.*

Science News Letter, July 23, 1955

⚙ *AUTOMATIC SWITCH is a light-sensitive mechanism that turns lights on when it grows dark outside, and off when it becomes light again. Unlike clock-type switches, this gadget switches lights on at a different time each night. The switch is good burglar insurance for people on vacation, and can also be used to switch on lights in store windows or dangerous areas.*

Science News Letter, July 23, 1955

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Do You Know?

The United States has agreed to sell 30 tons of *heavy water* for research reactors.

Repairing cost on an *automobile* has risen 20% in the past five years.

Laying *hens* seem to function best at temperatures somewhere between 50 and 60 degrees Fahrenheit.

Viruses vary in size, the largest being about the same size as the smallest bacteria and the smallest about the same size as an ordinary protein molecule.

Nests of the *oropendola,* or "giant oriole," are narrow bags two to three feet long, woven of straws and weeds; there may be as many as 50 of these nests in a single tree.

Increased drinking of cool water together with the evaporation of moisture from the lungs through normal breathing are the best ways for a *chicken* to cool itself when the temperature rises above 90 degrees Fahrenheit.

One kilowatt-hour of *electricity* will light a 150-watt reading lamp for six and two-thirds hours, run a clock for 20 days, run a vacuum cleaner for three hours, run the average electric refrigerator for one day, or operate a TV set for three hours.